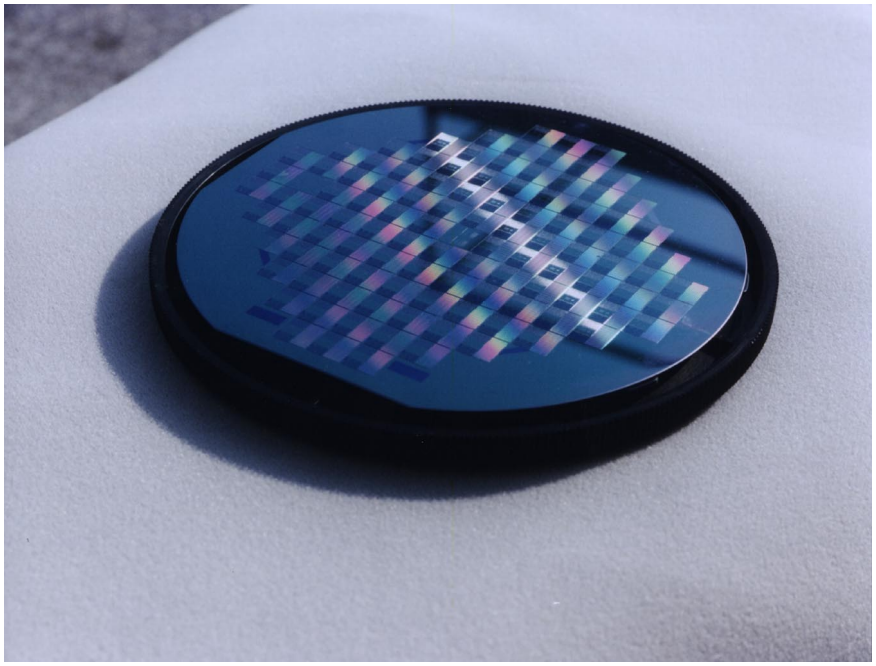
Technology Opportunity

Diffractive Optics at Marshall Space Flight Center (MSFC)

Marshall Space Flight Center (MSFC) is the Center of Excellence for Space Optical Systems. Because of this, MSFC is NASA's lead center for identifying the technologies required to affordably produce the large space telescopes necessary for future missions. MSFC takes the lead in the process where NASA, other Government agencies, industry, and academia identify the technologies of the future, guided by the scientifically derived strategic plans. Another of the Center's responsibilities is to successfully infuse new technology into future missions.

MSFC and the U.S. Army MICOM Research, Development, and Engineering Center of Huntsville, Alabama, have established a co-located, joint micro-fabrication facility at the Redstone Arsenal where optical and direct-write electron beam lithography capabilities are in place. The major goal of this partnership effort is to foster fabrication research and development in the areas of diffractive optics and integrated optics. Additionally, the joint-housed facility provides technical support to projects in the development and application of advanced micro-optical systems, and serves as a focal point for technology transfer between industry, Government agencies, and university communities.



Potential Commercial Uses

Advancements in electro-optics have applications for improved law enforcement capabilities, high-speed measurement of engine components, non-invasive blood-flow rate monitoring, non-invasive imaging of internal organs, "over the fence" pollution monitoring, and many other uses in a wide variety of industry and commercial fields.

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National Aeronautics and Space Administration

George C. Marshall Space Flight Center

Benefits

Industry, other Government agencies, and academia have the potential to save a great deal of time and money as they take advantage of the expertise and capabilities at MSFC. The Center provides access to these facilities and equipment in an effort to ensure the U.S. stays on the cutting-edge of technology.

The Technology

The diffractive optics work being conducted at MSFC is a very promising technology for many space-based missions, including planetary discovery satellites. This technology could offer significant size and weight reductions, as well as potential increases in ruggedness and performance over standard optical systems. In addition, the diffractive optics technology enables many new and advanced microfabrication-based photonics technologies.

Where planetary discovery satellites are concerned, the area of space science may be most enabled by the introduction of diffractive optics. Diffractive optics could replace or hybridize conventional optical components to produce achromatic or athermalized optical systems. Many new and advanced micro-sensor technologies, such as those based on fiber optics, integrated optics, electro-optics, and micro-machining are extremely well suited for diffractive optics, anti-reflective coatings, polarizers, spectrometers, real-time signal processing, optical interconnects, telescope aberration correction, and communications.

Contacts

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Additional information about the Diffractive Optics, NASA's Technology Transfer Program, and a Technology Transfer Agreement are available on the World-Wide Web:

http://techtran.msfc.nasa.gov

Key Words

Diffractive Optics
Technology Transfer